CORRES. CONTROL
OUTGOING LTR NO.

9ORF6700

DIST.	LTR	ENC
ALLHOFF, F.H.		
BRANCH, D.B.		
BREEN, J. H.		
BURLINGAME, A.H.		
CROUCHER, D.W.		
DAVIS, J.G.		
EVERED, J.E.	X	X
FERRERA, D.W.		
FERRIS, L.R.		
FRANCIS, G.E.		
GOODWIN, R.		
HEALY, T.J.		
KERSH, J.M.	X	X
KIRBY, W.A.		
KIRKEBO, J.A.		
MAJESTIC, J.R.		
McDANIEL, M.G.		
MELLEN, J.B.		
MEURRENS, B.E.		
MONTROSS, R.W.		
MORGAN, R.V.	X	X
NORTH, P.		
PARNELL, R.F.		
POTTER, G.L.	X	X
RHOADES, J.L.	X	X
SAFFELL, B.F.		
SHANNON, W.M.		
SWANSON, E.B.		
VAN LEUVEN, D.B.		
WARNER, B.P.		
WEEBY, J.S.		
WILKINSON, R.B.		
YOUNG, E.R.		
ZANE, J. O.	X	X
McArth		
Bartlett		
Lee, E. L.	X	X
CORRES CONTROL	X	X

CLASSIFICATION:

UCNI	X	X
UNCLASSIFIED		
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE

DATE 11/5/90

IN REPLY TO LTR

PC#

LTR APPROVALS:

ORIG & TYPIST INITIALS

RF-46469 (Rev 10/90)

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

0000028916

November 8, 1990 90-RF-6700

Robert M. Nelson, Jr.
Manager
DOE, RFO

Attn: R. J. Schassburger

IAG DELIVERABLE FOR EPA AND CDH

SUBMITTAL OF HISTORICAL INFORMATION SUMMARY AND PRELIMINARY QUALITATIVE HEALTH RISK ASSESSMENT OPERABLE UNIT NO. 3 SWMUs 200, 201 & 202

As required by the IAG, we are providing two copies of the Historical Information Summary and Preliminary Qualitative Health Risk Assessment Operable Unit No. 3 - SWMUs 200, 201 & 202. Your staff has reviewed and commented on draft versions of this report.

This document should be forwarded to EPA/CDH for comments by November 9, 1990. Enclosed is a draft letter of the transmittal to EPA/CDH for your approval. We are prepared to deliver the document to the agencies as soon as we receive your transmittal letter. Please contact T.C. Greengard at extension 7121, L. Woods at extension 5417 or M. Guillaume at extension 4291 when your transmittal letter is ready.

J. M. Kersh
Associate General Manager
Environmental Restoration and Waste Management

MG:rsh

Orig. and 1cc: - R. M. Nelson, Jr.

Enclosures:
As Stated

EXECUTIVE SUMMARY

This document provides a summary of the existing site characteristics and environmental data related to contamination in three off-site reservoirs: Great Western Reservoir (Site 200), Standley Lake (Site 201), and Mower Reservoir (Site 202). The sediments in these reservoirs contain low levels of plutonium as a result of past activities at the Rocky Flats Plant. A qualitative evaluation of the human health risk associated with plutonium contamination in these three reservoirs is provided.

This document for sites 200, 201, and 202 of Operable Unit No. 3 (OU 3) was prepared in response to requirements in the draft Interagency Agreement (IAG) between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Health (CDH). The IAG identifies the following primary objectives for this report:

1. Submit all known and accumulated data describing, detailing or defining contamination within the reservoir(s) and tributaries of the reservoir(s) including surface and ground water sources, and

2. Submit a health risk assessment documenting the risks derived from all potential exposures associated with a no action alternative for remediation of the contamination.

After evaluating over 30 documents containing data relevant to sites 200-202, it became evident that it would be impractical to append the existing data to this document. The IAG data submission requirement is addressed by summarizing pertinent data in Section 2.0, by identifying specific data sources for each site in Table 2.1, and by including a bibliography listing general references and available documentation of data for sites 200-202 (Section 6.0). It also became apparent during the review of the data that the specificity and quality of existing information are insufficient to perform a rigorous quantitative human health risk assessment. In order to utilize data in a quantitative health risk assessment, the data must be validated, either by utilizing the EG&G Environmental Restoration Program data validation procedure or by collecting additional samples to verify that the data are representative. As a result, this document presents a Qualitative Human Health Risk

Assessment (Section 4.0) which evaluates release mechanisms, transport mechanisms, and exposure routes associated with sites 200-202.

While a quantitative risk assessment is needed to satisfactorily evaluate potential exposures to the public, the qualitative assessment presented in this report provides information which will enable future data collection activities (e.g. Remedial Investigations) to focus on the most significant exposure pathways. The following discussions provide a brief summary of the information provided in this report in support of the objectives listed above.

Sites 200 (Great Western Reservoir), 201 (Standley Lake), and 202 (Mower Reservoir) comprise three of the four sites within Rocky Flats Plant (RFP) OU 3. The three reservoirs are located outside the eastern boundary of the RFP. Great Western Reservoir serves as the municipal water supply for the City of Broomfield, while Standley Lake supplies water to the cities of Thornton, Northglenn and Westminster. Mower Reservoir is a much smaller, privately-owned impoundment used for agricultural purposes (i.e., cattle watering and irrigation).

Past environmental investigations of Great Western Reservoir and Standley Lake have shown that plutonium concentrations in the bottom sediments of both reservoirs exceed estimated background (nuclear testing fallout) concentrations. The elevated plutonium concentrations are attributed to historical airborne (fugitive dust) and waterborne releases from the RFP. These releases resulted primarily from routine RFP operations in the 1950s and 1960s. Pollution control measures implemented at the RFP since this time have effectively eliminated the source of the plutonium. In addition, surface water control measures now prevent runoff and effluent from the main RFP production facility from reaching the reservoirs. Studies to assess the impact of past RFP releases on these two reservoirs have concluded the following:

- Routine water quality monitoring indicates that water quality in the two reservoirs has not been measurably impacted by the plutonium in the sediments.

- Plutonium is the only contaminant of concern in the reservoirs attributable to RFP releases.

- A discrete plutonium-bearing layer of bottom sediments in both reservoirs has been covered by subsequent sedimentation. The highest plutonium concentrations are believed to occur in the deepest areas of each reservoir.

- Plutonium's high affinity for clay effectively immobilizes it in the sediments. No evidence of post-depositional migration through the sediment column has been detected.

Plutonium concentrations in Mower Reservoir have not been studied to date. Some of the land surrounding Mower Reservoir is known to have been contaminated by airborne particulates from the RFP. The reservoir is fed by a diversion from Woman Creek, which flows from the RFP and is also a possible historical source of plutonium in Standley Lake.

The results of the qualitative risk assessment (Section 4.0) indicate that airborne reentrainment of exposed sediments is the only credible environmental pathway that could impact the public. However, it is not possible to evaluate the potential risk to human health associated with this exposure pathway without performing a quantitative risk assessment.

The information presented in this report points to the following additional conclusions about sites 200-202:

- The concentrations of plutonium in the sediments in areas of highest exposure potential (i.e., near-shore areas) of Great Western Reservoir and Standley Lake are above background, but are below the CDH guideline for plutonium in soil of 0.9 picocurie per gram (pCi/g) (0.03 becquerel per gram (Bq/g)). The data supporting this conclusion, however, have not been validated.

- No data have been collected to assess plutonium concentrations in Mower Reservoir sediments. Because general site conditions and contaminant sources for Mower Reservoir appear similar to those for Great Western Reservoir and Standley Lake, it is expected that Mower Reservoir sediment plutonium concentrations are not significantly different than those in Great Western Reservoir and Standley Lake.

- Of the ten potential exposure pathways identified for the reservoirs, the airborne pathway from reentrainment of exposed sediments is the only credible pathway that will convey plutonium to human receptors from sites 200-202.

- Airborne plutonium concentrations measured by air monitors downwind of sites 200-202 have remained well below the 0.02 pCi/m^3 (0.0007 Bq/m^3) standard set by CDH.

- Residential tap water derived from Standley Lake and Great Western Reservoir is routinely analyzed for plutonium. Results consistently indicate that plutonium concentrations are well below CDH drinking water standards.

- Plutonium is strongly adsorbed to the clay-rich sediments typical in impoundments near the RFP. Studies have shown that plutonium in the reservoir sediment columns is effectively immobilized.

It is recommended that additional data necessary to support a quantitative risk assessment for sites 200-202 be collected. Additional data needs are identified in Section 4.11. The data will be collected during future Remedial Investigation activities. This report will serve as the basis for the Remedial Investigation scoping process.

Mr. Gary Baughman
Hazardous Waste Facilities Unit Manager
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220

DRAFT

Mr. Martin Hesmark U.S. Environmental Protection Agency, Region VIII
ATTN: Rocky Flats Project Manager, 8HWM-RI
999 18th Street, Suite 500, 8WH-C
Denver, Colorado 80202-2405

Gentleman:

Enclosed for your review are two copies of the Historical Information Summary and Preliminary Qualitative Health Risk Assessment Operable Unit No. 3-SWMUs 200, 201 & 202. The Department of Energy is required to submit this document by November 9, 1990, in accordance with the Interagency Agreement (IAG) Schedules.

Pursuant to the latest IAG schedule, the Environmental Protection Agency and the Colorado Department of Health are required to complete the review of this report by February 18, 1991. Resolution of comments will follow and submittal of the Final Remedy Report is scheduled for April 16, 1991.

If you have any questions, please feel free to contact Bob Birk or Kesh Murthy of my staff at 966-5921 and 966-2184, respectively.

Sincerely,

Enclosure